Enumerations – CPE, CVE, CCE

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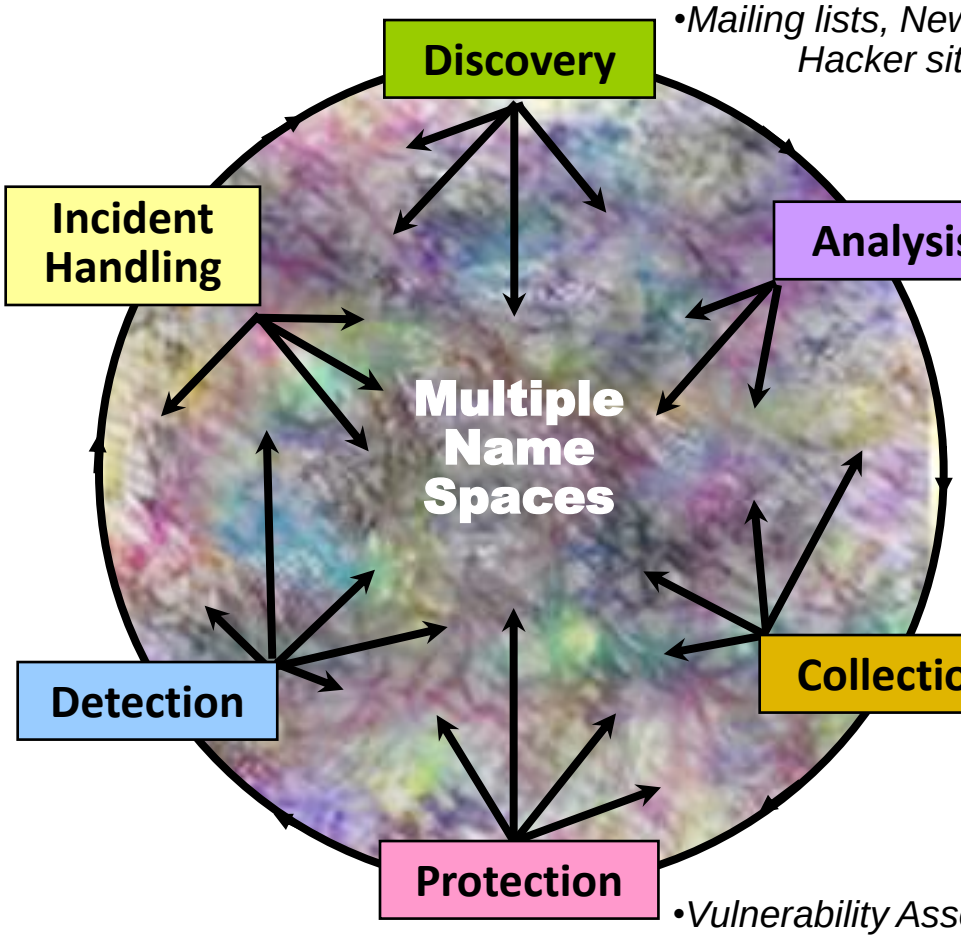
“Whoever finds it, names it”



•*Mailing lists, Newsgroups, Hacker sites*

•*Incident Reports*
•*Incident Response Teams*

•*Academic Studies*
•*Advisories*

•*Intrusion Detection Systems*

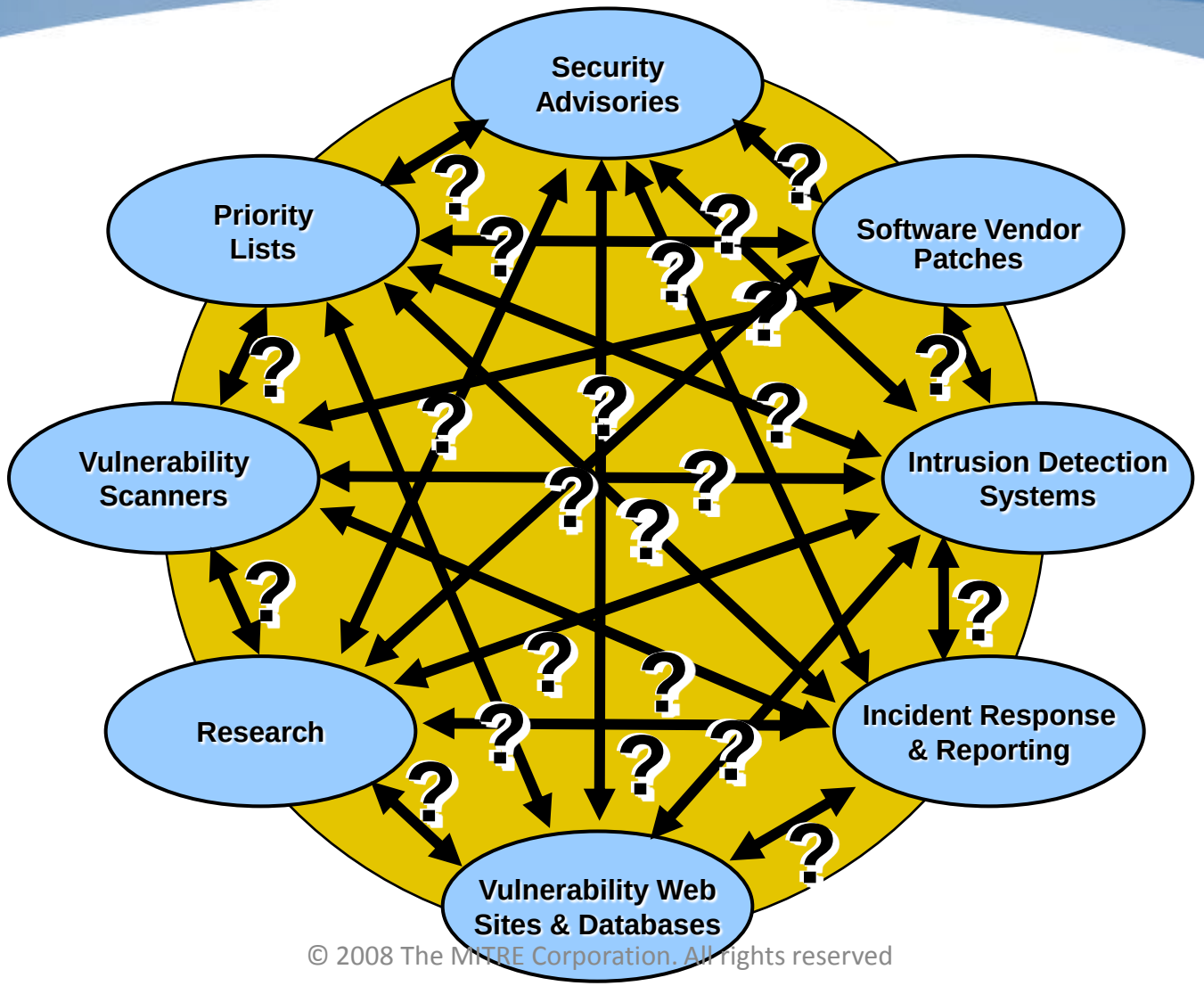
•*Databases*
•*Newsletters*

•*Vulnerability Assessment Tools*

Communication

- English = “apple”
- French = “pomme”
- Spanish = “manzana”
- Russian = “яблоко”
- Japanese = “リンゴ”
- German = “apfel”

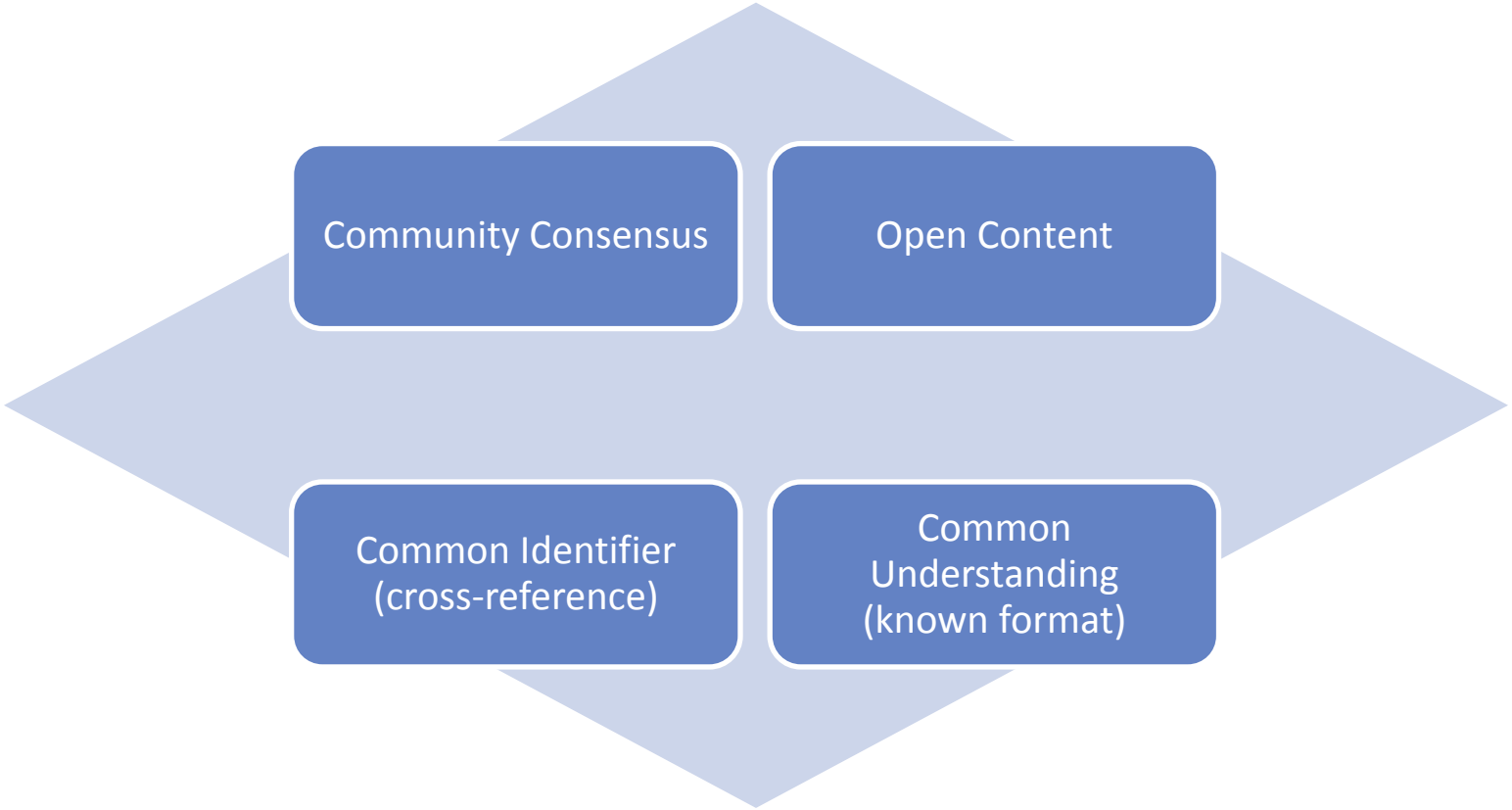
Difficult to Integrate Information



Common Identifier Needed

Standardization of terms will allow for seamless communication.

What do we mean by standardization?



Enumerations Defined

- a naming scheme
  - specific entities identified using a common term
- defined set of things
  - seen to be members of the same category
- used by multiple groups
  - communicate with each other
  - coordinate activities
- just enumerate the entities
  - trying to do more leads to many problems related to different use cases

By keeping things simple, we can accomplish a lot.

Benefits of Enumerations

- Enable faster, more accurate correlation
  - Standardized identifiers used in:
    - Databases
    - Tools
    - Guidance
- Facilitate information exchange
  - Requirements – what do we need to check for?
  - Reporting – what did we find?
  - Roll-up – how do standard elements map to local needs?
  - Information more easily flows:
    - Across the configuration management lifecycle
    - Through different communities of interest
- Allow increased automation
  - Diverse tools can share input and output

IA Data Without Enumerations

- data correlation is:
  - Mostly manual
  - Key word driven
  - Costly
  - Error prone
  - Pair-wise between data sets
  - Unscalable
- result:
  - Data is locked in proprietary repositories

IA Data With Enumeration

- common identifiers:
  - Community agree upon "tags"
  - Easily added to legacy repositories & tools

- KEY: common identification enables correlation!
  - Faster
  - More accurate
  - Less expensive

Enumerated Entities in SCAP

- CVE - Vulnerabilities
  - CVE-2006-4838

    Description: Multiple cross-site scripting (XSS) vulnerabilities in DCP-Portal SE 6.0 allow remote attackers to inject arbitrary web script or HTML via the (1) root_url and (2) dcp_version parameters in (a) admin/inc/footer.inc.php, and the root_url, (3) page_top_name, (4) page_name, and (5) page_options parameters in (b) admin/inc/header.inc.php
- CCE - Configuration Settings
  - CCE-2116-2

    Description: The "restrict guest access to application log" policy should be set correctly.
    Parameters: enabled/disabled
- CPE - Platforms
  - cpe:/o:microsoft:windows_xp:::pro

    Title: Microsoft Windows XP Professional

Common Platform Enumeration (CPE™)

- CPE Name
  - identifies a platform type
    - does not ID a system
  - ideally associated with an OVAL Inventory Definition
- CPE Language
  - used to combine CPE Names to identify complex platform types
- CPE Dictionary
  - collection of known CPE Names

CPE Status

Sponsor	**NSA**
Community Type	**Open Working Group**
Maturity	**- Concepts mature, content in development** **- Version 2.1 released Jan 31, 2008**
Adoption	**- Early stages** **- Used by NVD, FDCC** **- 7 SCAP Validated products**

MITRE

CPE Name Format

- repeatable format
  - 2 people in different rooms will come up with the same name
- name is built by using known information
  - 7 (optional) components

cpe:/ part : vendor : product : version : update : edition : language

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Prefix Property

- set of platforms identified by a long name should be a subset of the set of platforms identified by a shorter initial portion of that same name
  - called the “prefix property”
  - allows matching to take place

For example:

cpe:/o:microsoft:windows_xp::sp2

would be a subset of

cpe:/o:microsoft:windows_xp

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Dictionary

- Collection of known CPE Names
  - help users determine which names exists
  - help those creating new names
  - enough information to identify the platform
    - others can build more elaborate repositories based off dictionary

- Hosted by NIST at:

  http://nvd.nist.gov/cpe.cfm

CPE Resources

- Web site: http://cpe.mitre.org

- Mailing list: cpe-discussion-list
  - Open forum for developing the specification
  - registration form
    - http://cpe.mitre.org/registration.html

Common Vulnerabilities and Exposures (CVE®)

- Dictionary of standardized descriptions for vulnerabilities and exposures
  - Over 31,000 entries
- Publicly accessible for review or download from the Internet

ID: CVE-2007-1751

Description: Microsoft Internet Explorer 5.01, 6, and 7 allows remote attackers to execute arbitrary code by causing Internet Explorer to access an uninitialized or deleted object, related to prototype variables and table cells, aka "Uninitialized Memory Corruption Vulnerability."

Reference: BUGTRAQ : 20070612 ZDI-07-038 - Microsoft Internet Explorer - Prototype Dereference Code Execution Vulnerability

Reference: MS : MS07-033

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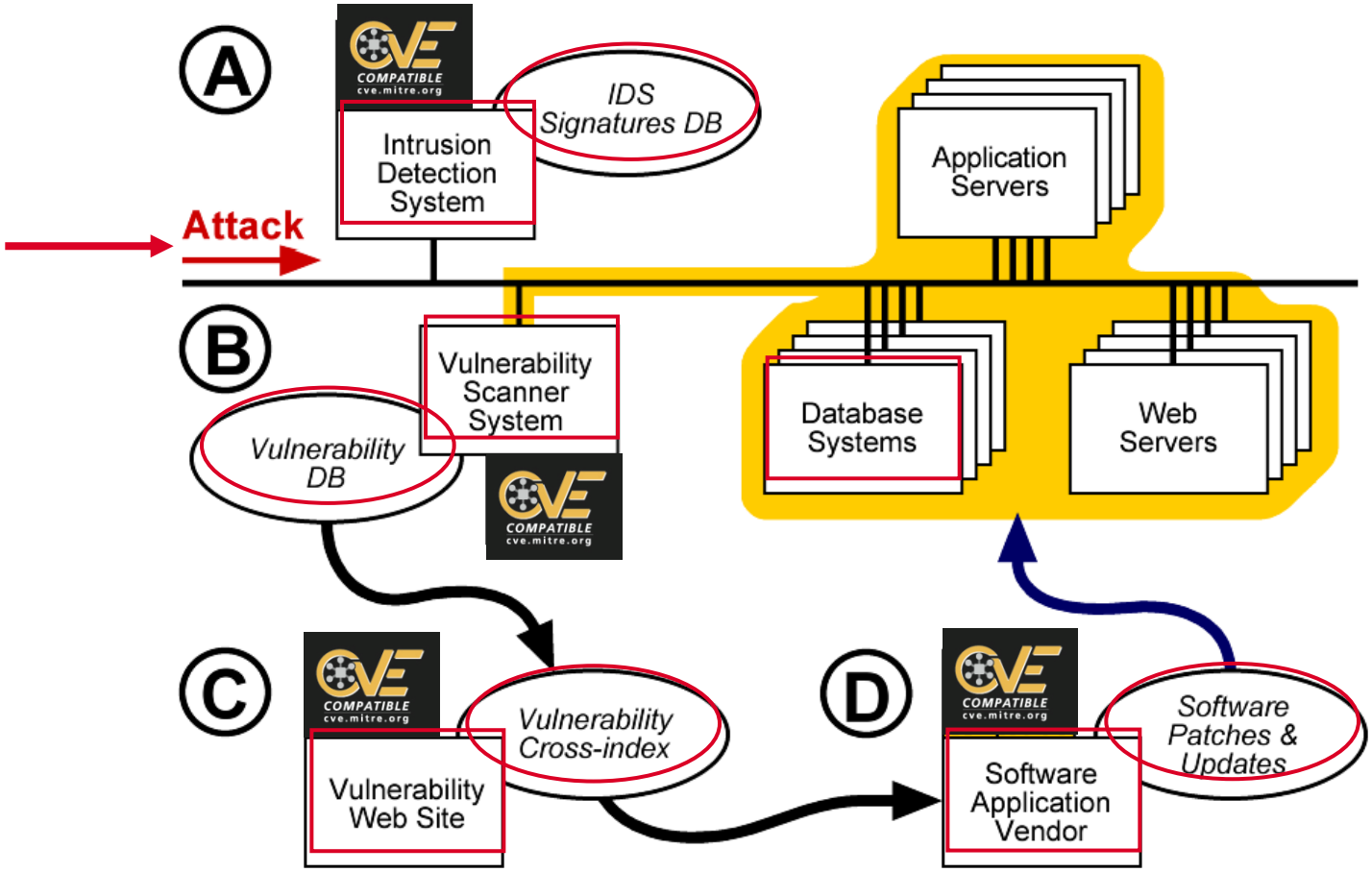
CVE Status

Sponsor	**DHS**
Community Type	**Editorial Board** **- Membership by invitation / nomination**
Maturity	**Mature**
Adoption	**Widespread** **- Over 280 products in 27 countries** **- Over 80 officially compatible**

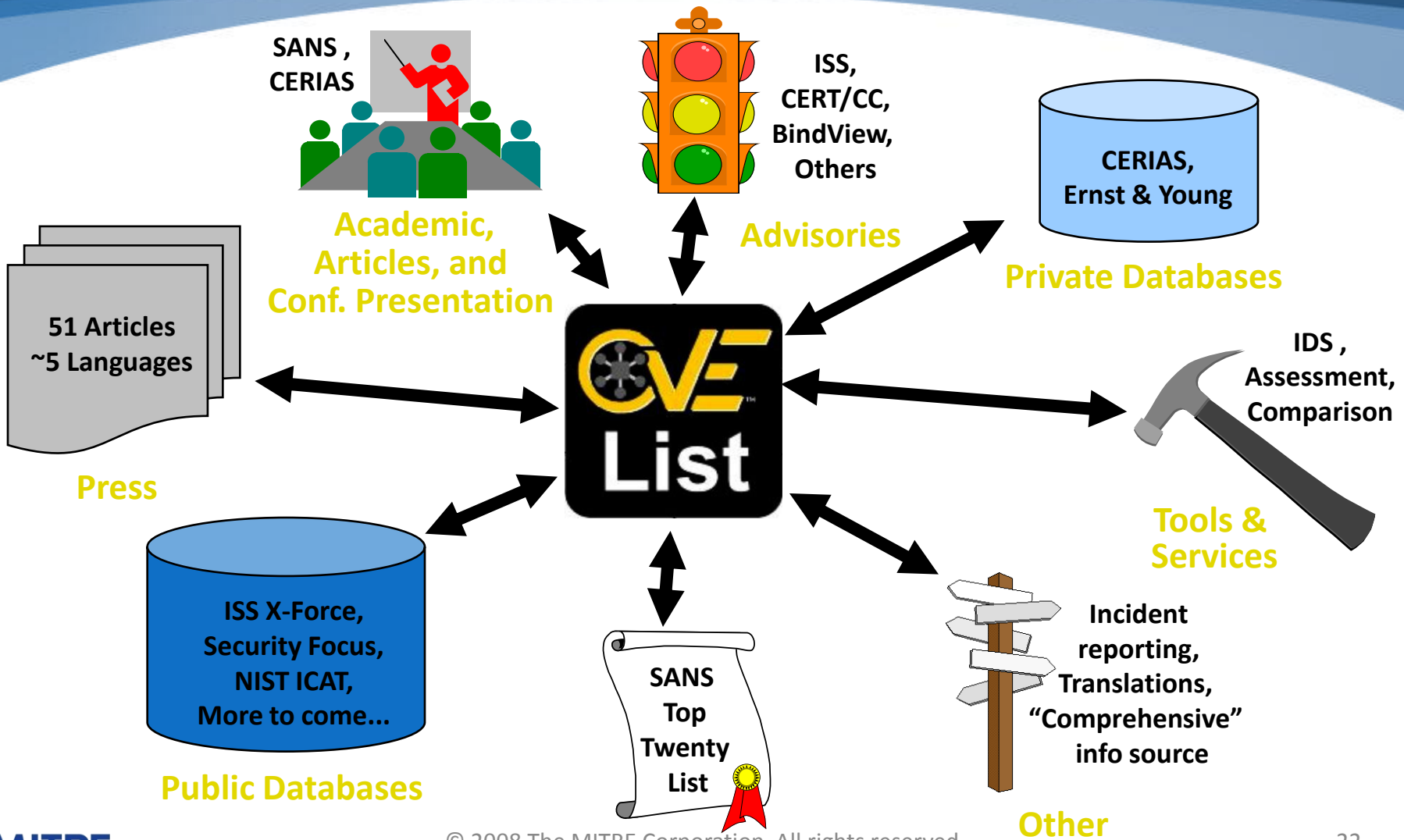
Leveraging CVE compatibility



CVE List

- List of all known CVE identifiers
  - 32,261 (as of sept 10, 2008)
  - hosted at http://cve.mitre.org
  - xml feed
- NVD at NIST provide full search capabilities
  - additional metadata

The Center of Many Activities



Common Configuration Enumeration (CCE™)

- Assigns standardized identifiers to configuration issues, allowing comparability and correlation

ID:	CCE-3121-1
Description:	The "restrict guest access to application log" policy should be set correctly.
Technical Mechanisms:	(1)HKLM\SYSTEM\CurrentControlSet\Services\EventLog\Application\RestrictGuestAccess (2) defined by Group Policy
Parameter:	enabled/disabled

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CCE Status

Sponsor	**NSA**
Community Type	**Open Working Group**
Maturity	**- Concepts mature, content in development** **- Version 5 released Mar 5, 2008**
Adoption	**- Early stages** **- Microsoft security (Office 2007, Server 2008)** **- Primary identifier for FDCC** **- 7 SCAP Validated products**

The Identifier

The use of CCE-IDs as tags provide a bridge between natural language, prose-based configuration guidance documents and machine-readable or executable capabilities such as configuration audit tools.

- last digit is a check digit
- assigned on per platform basis

Descriptions

- a humanly understandable description of the configuration issue
- describes the configuration control
  - but does not assert a recommendation

Technical Mechanisms

- the technical setting that is being identified
  - for any given configuration issue there may be one or more ways to implement the desired result
- specific mechanisms
  - registry keys
  - group policy paths
  - api calls

Parameters

- parameters that would need to be specified in order to implement a CCE on a system
  - describes the possible values or the conceptual range of values
- the human readable notation
  - “enabled” instead of “1”

Enumerations - Creation

- content teams ensure uniqueness
- leverage vendor and community knowledge
- regular updates to official lists
- feedback channel to report issues

Summary

When dealing with information from multiple sources, use of consistent identifiers can

- improve data correlation
- enable interoperability
- foster automation
- and ease the gathering of metrics for use in situation awareness, IT security audits, and regulatory compliance.